Finality of Action Must be Withdrawn as Premature

The current official action is a first action in response to the RCE filed on August 24, 2002, and has been made final. The RCE included a proper submission, though no claim amendments, *with new arguments and evidence* traversing the claim rejections. The current official action *does not reply to, or even acknowledge,* any of the new arguments or evidence raised.

A determination of obviousness under §103 should rest on all the evidence and *should not be influenced by any earlier conclusions. In re Eli Lilly & Co.*, 902 F.2d 943, 945, 14 USPQ2d 1741, 1743 (Fed. Cir. 1990); *MPEP* §2144.08, p. 2100-145. The official action, instead, simply again **reiterates** essentially the same rejection from the last action. Clearly, ***the Office has improperly relied solely on prior conclusions***, and has not considered the new arguments or evidence in the applicant's last submission. The official action does not address any of the applicant's arguments traversing the rejection. The action also does not address any of the supporting evidence for such arguments, the evidence having been taken directly from the two cited references. The arguments and evidence directly contradict the position taken in the action.

The applicant is entitled to consideration of all arguments and evidence submitted traversing the rejections. Since the Office has not done so in the current final action, the finality of the rejection must be withdrawn.

If the finality is withdrawn, *as it should be*, the amendments and remarks presented herein must be entered and considered. If the finality is not withdrawn, entry and consideration is still proper because no new issues have been presented herein for consideration and/or search.

Claim Rejections - 35 U.S.C. §103

Claims 1-40 have again been rejected under 35 U.S.C. §103(a) as obvious over Kondo, JP 4-10948 (Kondo) in view of Kneezel, U.S. Patent No. 5,598,191 (Kneezel). This rejection is overcome based on the foregoing amendments and the following remarks. Reconsideration and withdrawal of the rejection is hereby respectfully solicited.

Cited References Fail to Disclose All Claim Limitations

Independent method claim 1 recites "each swath being printed by a respective block of print elements *with an ink of a single formulation* and being wider than a swath printed by

a single print element *wherein the blocks of elements are arranged in groups in an elongate array, the blocks in each group being adapted for printing in different colours from each other, the array comprising at least two groups and wherein the blocks form a repeating pattern of constant pitch along the array.*" Claims 2 and 17 recite substantially similar limitations. Kondo and Kneezel, in combination, fail to teach such a printhead or print traverse.

To illustrate and turning first to Kondo, the reference discloses a regular spacing of nozzles in groups along an array with repeating color nozzle arrangements (see FIG. 2 of Kondo). Kondo discloses that each nozzle in a given group is for a ***different*** color. Claim 3 of Kondo might suggest that a swath of the same color may be printed with two nozzles of a group, but those two nozzles would be of *different light and dark ink formulation* (e.g. Light Magenta and Dark Magenta). Claims 1, 2, and 17 have been amended herein to recite that *each swath is printed by a respective block or group using an ink of a single formulation*. Kondo makes it quite clear that every nozzle in a group must be supplied with a different ink formulation. Thus, Kondo fails to teach or suggest this limitation.

The official action again refers to *both* FIGS. 2 and 8 of Kondo as disclosing aspects of the rejected claims. This is improper based on the Kondo disclosure itself. FIG. 8 in Kondo shows a nozzle arrangement that is *prior art to and that is to be replaced by* the arrangement of FIG. 2. Only the nozzle arrangement of FIG. 2 is disclosed for use with the printhead configuration and printing method of the Kondo being relied upon by the Office. FIGS. 2 and 8 in Kondo are *mutually exclusive*. ***The FIG. 8 nozzle arrangement will not work using the printhead configuration and printing method disclosed in Kondo and that is being relied upon by the Office.***

If the Office relies on the teachings of the Kondo printhead structure and method, then only the FIG. 2 nozzle arrangement will work. Thus, relying upon the nozzle arrangement of FIG. 8 is improper because there is no suggestion or motivation to do so that can be found with Kondo, or any other cited reference. In fact, there is an explicit suggestion not to combine the Kondo printhead and method with the FIG. 8 nozzle arrangement.

Turning next to Kneezel, this reference also fails to disclose or suggest at least the same limitation missing in Kondo. Kneezel does not disclose, for color printing, that *each swath is printed by a respective block or group using an ink of a single formulation*. In contrast, Kneezel discloses (see, for example, FIGS. 8-11 and col. 7, line 60) printing

perpendicular to the nozzle array direction to print repeating swaths of color deposited on a substrate. Each swath is printed by only a single nozzle of the group. *Each block or group of nozzles prints a separate swath during a given pass using more than one ink formulation* (i.e more than one color). Neither Kondo nor Kneezel discloses at least the above limitation of claims 1, 2, and 17.

Further, in Kneezel there is also a different spacing between the blocks in the nozzle array. This difference, while it may appear slight, is important. Kneezel is capable of printing at double the density of a row of nozzles. However, this does not help with speed when printing at single density, because of the disclosed spacing. Indeed, the speed of the Kneezel device is no faster than printing with a single row of color nozzles (CMYK) since, in order to print an image using only one group of nozzles, K must be the first row printed and C must be the last. This is because the ejected drops should be in registry with one another.

To illustrate, printing Y first with the Kneezel nozzle arrangement, for example, in a row having a CMYK group arrangement requires that the K portion of the image be printed using the K from a *different group*. However, in Kneezel, the neighboring group is at a different spacing and, thus, the K would not overprint the Y. These problems would carry over if the Kneezel controlling steps were utilized with the Kondo printhead, as proposed by the official action.

In the present invention as claimed, the first row printed can be any one of CMYK, as the Y, M, and C can all be overprinted. This is because, since the nozzles are all at the same spacing, nozzles of an adjacent group can overprint any previous swath. The number of steps across the substrate required, as a result, is at least 6 less (3 at either end) than that needed for the Kneezel control steps. Therefore, modifying the Kondo printhead using the Kneezel control steps would not result in the more efficient printing method recited in claims 1, 2, and 17.

Independent claims 1, 2, and 17 are not rendered obvious by the combined teachings of Kneezel and Kondo. Thus, claims 1, 2, and 17, and corresponding dependent claims are in condition for allowance.

No Motivation to Combine Reference Teachings

As the Office well knows, the motivation to combine reference teachings must be found within the references themselves, and not from the applicant's own disclosure. The Office continues to base the rejection on a combination of Kondo and Kneezel, and on a

further combination of Kondo FIG. 8 with the Kondo printhead and method. There is no proper suggestion or motivation to combine such teachings that can be found within the references themselves. *The Office has not yet replied to this argument, and is asked to do so in the next action.*

Neither Kondo nor Kneezel provides the necessary motivation or suggestion, and none is set forth in the action. The only identifiable "motivation" to combine these references is found at page 3 of the action, which states only that "it would have been obvious to one of ordinary skill in the art ... to provide the controlling steps as taught by Kneezel in Kondo's printhead *for printing overlapped print swaths in registry with the previously printed swaths.*" This is nothing more than a conclusory statement reiterating only a portion of the applicant's claim language. The action does not support the combination with any suggestion or motivation taken from the references or from any other proper source. It is clear that only improper hindsight has been employed and that applicant's own disclosure is the sole source of motivation or suggestion for the purported combination.

No attempt has been made by the Office to put forth a proper motivation or suggestion for combining the teachings of Kneezel and Kondo. Thus, the rejection based on the combined teachings of Kondo and Kneezel must be withdrawn.

Furthermore, the action states that Kondo claims 1 and 3 and FIGS. 2 and 8 teach many aspects of the claimed printing method and printhead. Based on this and this alone, the rejection is improper because it relies on combining the teachings of FIGS. 2 and 8 of Kondo. There is no basis for this untenable assertion for several reasons.

First, Kondo actually teaches away from such a combination as discussed above. Kondo offers the printhead of FIG. 2 as a complete substitution for the inferior FIG. 8 printhead, which would not work using the disclosed Kondo method. Combining any of the features of the two printheads is simply not suggested within the Kondo reference.

Second, features of the two printheads cannot be combined without destroying the printing method teachings of Kondo. The distance of printhead travel using the nozzle configuration of FIG. 2 is much less than that required for the arrangement of FIG. 8. Kondo explains that the distance of *head travel of the prior art FIG. 8 printhead is the print width plus twice the head width, because there are no repeating blocks.* This is necessary to ensure that all colors are appropriately printed, and can be true only if there are ***no repeating blocks*** of color nozzles. Thus, the FIG. 8 printhead cannot have repeating blocks of nozzles.

The inventive method of Kondo reduces head travel to only slightly more that one head width by utilizing repeating blocks of different color nozzles. As a result, using the FIG. 8 nozzle arrangement would destroy the printhead function disclosed in Kondo, which is that of reducing head travel.

The FIG. 8 printhead arrangement also would not function if the Kneezel control steps are used, because the Kneezel steps also require repeating blocks. In contrast, the FIG. 2 printhead in Kondo is intended to have, *and must have*, repeating blocks or groups of different color nozzles in order to perform as intended. Thus, features of the FIG. 8 printhead cannot be combined with the FIG. 2 printhead nor with the Kondo printhead function or the Kneezel control steps.

The action fails to provide any motivation or suggestion to combine the teachings of Kondo FIG. 8 with those of FIG. 2 and the Kondo printing method. The combination of Kondo FIG. 8 with any other teachings of Kondo or Kneezel is therefore improper. The rejection based on Kneezel and Kondo must be withdrawn.

Cited Combination Destroys Express Teachings of Both References

By combining the teachings of Kondo and Kneezel as purported in the action, express teachings in both references are destroyed. Such a combination is improper. *Again, the Office has not yet replied to this argument and is asked to do so in the next action.*

To illustrate, Kondo teaches a single nozzle row printhead that travels laterally in a direction *parallel to the nozzle row* or array direction across a page width. The limited lateral distance traveled is intended to be only as wide as one unit of a repeating pattern of color nozzle units. Upon completing a short lateral traverse, all colors and all pixels for a swath are printed. The Kondo printhead is intended to completely print one and only one swath during a single lateral traverse. The printhead and paper are then indexed lengthwise. Once the printhead has traversed the length of the paper, the Kondo print process is completed. Thus, the Kondo printhead travels very little in the array direction, as intended. Each traverse of the Kondo printhead prints single swaths each of a width equal to a single nozzle width. The printhead must traverse relative to the entire substrate length to print on the entire substrate surface.

The action purports to combine the print control process of Kneezel to the printhead nozzle arrangement of Kondo. Making this combination is simply not plausible and would destroy express teachings in both references. Kneezel teaches a process for moving a

printhead *perpendicular* to the array direction or to the nozzle row. Kneezel also teaches printing multiple swaths *during each traverse*. The Kneezel printhead must traverse the page width completely for each swath and must do so many times. Thus, the Kneezel printhead travels quite a distance on each relative traverse, *which is opposite of the Kondo printhead.*

The Kneezel process, which the action proposes to combine with the Kondo printhead and method, is described at column 8, lines 2-11 and requires the offset spacing as discussed above. The printing procedure is the same for each color ejector and for each ejector set. Kneezel states that:

> "The first k ejector in the printhead first places alternating spots of black ink in a particular horizontal row in the grid, while the next k ejector (second from the bottom) **fills in** the alternating spaces which were left by the first k ejector. Similarly, with the y, m and c ejectors, the first of each pair lays down alternating spots and the second of each pair fills in the spaces which had been left by the previous pass of the preceding ejector in the preceding pass (emphasis added)."

As seen from FIGS. 8-11, the first of the k, y, m, and c ejector pairs lays down alternating spots in the same pattern, and the second of each pair only fills in the spaces *between* the alternating spots. As described at col. 8, lines 12-29, the second set of ejectors fills in the rows between the alternating swaths of print left by the first set of ejectors. In this way, Kneezel requires that *many subsequent passes* occur before all overprinting of swaths occurs, and before any given swath is completed. This is the antithesis of what Kondo expressly teaches.

The only way to correctly apply the Kneezel process to the Kondo printhead is for the Kondo printhead to travel perpendicular to the nozzle row. However, operating the Kondo printhead in such a direction would also result in the printhead making multiple long distance passes to print each swath. Traveling large distances for each of many multiple traverses would completely destroy the express teachings of Kondo.

Alternatively, if the Kneezel process were applied to the Kondo printhead and operated to move the printhead laterally as taught by Kondo, the express teachings of Kneezel would be destroyed. This is because the Kneezel lock-step process requires the printhead to travel perpendicular to the row of nozzles. The process cannot be properly performed otherwise.

Combining the teachings of Kneezel and Kondo destroys the express teachings of both references. The combination is, therefore, improper and the rejection must be withdrawn.

For all of the above reasons, the rejection of all claims based on a combination of Kneezel and Kondo must be withdrawn, and such action is respectfully solicited.

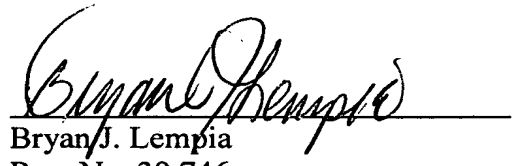
CONCLUSION

Claims 1-4, 7-17, 19, 22, 24-26, 28, and 31-40 are in condition for allowance in view of the foregoing amendments and the following remarks. Reconsideration and withdrawal of the rejection is hereby respectfully solicited.

The examiner is invited to contact the undersigned at the telephone number listed below in order to discuss any remaining issues or matters of form that will place this case in condition for allowance.

A petition for a one-month extension of time and the appropriate fee accompany this paper. No additional fee is believed due at this time. However, the Commissioner is hereby authorized to charge any fee deficiency, or to credit any overpayments, to Deposit Account No. 13-2855 of the undersigned's firm.

Respectfully submitted,



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VERSION SHOWING CHANGES MADE

In the Claims

Please cancel claims 5, 6, 18, 20, 21, 23, 27, 29, and 30 without prejudice herein, and amend claims 1, 2, 3, 7-9, 12, 17, 19, 28, 31-33, and 36 as follows:

1. (Twice Amended) A method of colour printing which includes the steps of:

(a) printing pixels in swaths of different colours side by side in a repeating pattern in a first relative traverse of a printhead and a surface to be printed, each swath being printed by a respective block of print elements with an ink of a single formulation and being wider than a swath printed by a single print element wherein the blocks of elements are arranged in groups in an elongate array, the blocks in each group being adapted for printing in different colours from each other, the array comprising at least two groups and wherein the blocks form a repeating pattern of constant pitch along the array;

(b) relatively indexing the printhead and the surface in a direction other than that of the relative traverse, and

(c) in a further relative traverse printing further swaths which at least partially overprint previously printed swaths in registry therewith, wherein each overprinting swath is of a different colour to the previously printed swath which it overprints.

2. (Amended) Colour printing apparatus comprising:

a printhead;

means for presenting a surface to the printhead for printing;

means for effecting a relative traverse of the surface and the printhead, the printhead comprising print elements arranged in blocks to print the surface with pixels in swaths of different colours side by side in a repeating pattern during said relative traverse, each swath being wider than that printed by a single print element and with ink of the same formulation and wherein the blocks of elements are arranged in groups in an elongate array, the blocks in each group being adapted for printing in different colours from each other, the array comprising at least two groups, a swath printed by a block of one group being at least

partially overprinted by a swath printed by a block of another group and wherein the blocks form a repeating pattern of constant pitch along the array;

means for relatively indexing the printhead and the surface in a direction other than the direction of relative traverse; and

means for controlling the traversing means, the indexing means and the print elements whereby to effect at least one further relative traverse and to effect said relative indexing between traverses so that each further traverse at least partially overprints at least one previously printed swath of pixels with a further swath in a different colour in registry therewith.

3. (Twice Amended) A method as claimed in claim 1 wherein [the blocks of elements are arranged in groups, the blocks in each group being adapted for printing in different colours from each other, the array comprising at least two groups,] a swath printed by a [clock] block of one group being at least partially overprinted by a swath printed by a block of another group.

7. (Twice Amended) A method as claimed in claim [5] 1 wherein printing is complete when the printhead and the surface have been relatively indexed through one cycle of the repeating pattern.

8. (Twice Amended) A method as claimed in claim [5] 1 wherein the blocks of print elements are adapted to print swaths of equal width, and the cyclic pitch of the repeating pattern is an integral multiple of the swath width.

9. (Twice Amended) A method as claimed in claim [5] 1 wherein the swaths are regularly distributed within the cycle of the repeating pattern.

12. (Twice Amended) A method as claimed in claim 11 wherein [the blocks form a repeating pattern with constant pitch and] when there are n said different colours the width of the printhead exceeds that of the surface by (n-1)/n of a pitch.

17. (Twice Amended) A colour printhead comprising an elongate array of blocks of print elements extending side by side in an array direction, the printhead being configured for relatively traversing a surface to be printed in other than the array direction, the blocks being arranged to print swaths of different colours side by side in a repeating pattern during said relative traverse, each swath being wider than a swath printed by a single print element and with ink of the same formulation and wherein the blocks of elements are arranged in groups, the blocks in each group being adapted for printing in different colours from each other, the array comprising at least two groups, the arrangement of the blocks being such that relative indexing of the printhead and the surface in the array direction permits printing of further swaths at least partially overprinting previously-printed swaths, wherein each overprinting swath is of a different colour to the previously printed swath which it overprints and wherein the blocks form a repeating pattern of constant pitch along the array.

19. (Twice Amended) A printhead as claimed in claim [18] 17 wherein the groups are of equal width in the array direction.

28. (Amended) An apparatus as claimed in claim [27] 2 wherein the groups are of equal width in the array direction.

31. (Amended) An apparatus as claimed in claim [29] 2 wherein printing is complete when the printhead and the surface have been relatively indexed through one cycle of the repeating pattern.

32. (Amended) An apparatus as claimed in claim [29] 2 wherein the blocks of print elements are adapted to print swaths of equal width, and the cyclic pitch of the repeating pattern is an integral multiple of the swath width.

33. (Amended) An apparatus as claimed in claim [29] 2 wherein the swaths are regularly distributed within the cycle of the repeating pattern.

36. (Amended) An apparatus as claimed in claim 35 wherein [the blocks form a repeating pattern with constant pitch and] when there are n said different colours the width of the printhead exceeds that of the surface by (n-1)/n of a pitch.